

CLAIMS

- 1 1. An apparatus comprising:
 - 2 (A) at least one processor;
 - 3 (B) a memory coupled to the at least one processor;
 - 4 (C) first and second logical partitions defined on the apparatus, the first logical
 - 5 partition controlling a shared network I/O adapter and the second logical partition using
 - 6 the shared network I/O adapter controlled by the first logical partition;
 - 7 (D) an I/O adapter sharing mechanism residing in the memory and executed by the
 - 8 at least one processor, the I/O adapter sharing mechanism comprising:
 - 9 (D1) an I/O adapter device driver in the first logical partition, the I/O
 - 10 adapter device driver including a hardware interface to the shared network I/O
 - 11 adapter;
 - 12 (D2) a virtual device driver in the second logical partition, wherein the
 - 13 virtual device driver provides a set of functions at least partially determined by
 - 14 functions available in the I/O adapter device driver in the first logical partition;
 - 15 and
 - 16 (E) a communication mechanism that controls exchange of information between
 - 17 the virtual device driver and the I/O adapter device driver.
- 1 2. The apparatus of claim 1 wherein the set of functions for the virtual device driver
- 2 is at least partially determined by querying the I/O adapter device driver for its available
- 3 functions.
- 1 3. The apparatus of claim 1 further comprising a transfer mechanism that transfers
- 2 data between the virtual device driver and the shared network I/O adapter without the data
- 3 passing through the I/O adapter device driver.

1 4. The apparatus of claim 1 wherein the communication mechanism comprises a
2 partition manager that communicates between the first and second logical partitions.

1 5. The apparatus of claim 4 wherein the communication mechanism further
2 comprises a hosting interface in the first logical partition that communicates between the
3 I/O adapter device driver and the partition manager, wherein the partition manager
4 communicates between the hosting interface in the first logical partition and the virtual
5 device driver in the second logical partition.

1 6. An apparatus comprising:

2 (A) at least one processor;

3 (B) a memory coupled to the at least one processor;

4 (C) first and second logical partitions defined on the apparatus, the first logical

5 partition controlling a shared network I/O adapter and the second logical partition using

6 the shared network I/O adapter controlled by the first logical partition;

7 (C1) the first logical partition comprising:

8 an I/O adapter device driver that includes a hardware interface to

9 the shared network I/O adapter;

10 (C2) the second logical partition comprising:

11 a virtual device driver that receives data to be sent to the shared

12 network I/O adapter and data received from the shared network I/O

13 adapter, wherein the virtual device driver provides a set of functions at

14 least partially determined by functions available in the I/O adapter device

15 driver in the first logical partition; and

16 (D) a communication mechanism coupled to the first and second logical partitions

17 that communicates between the virtual device driver and the I/O adapter device driver.

1 7. The apparatus of claim 6 wherein the set of functions for the virtual device driver

2 is at least partially determined by querying the I/O adapter device driver for its available

3 functions.

1 8. The apparatus of claim 6 further comprising a transfer mechanism that transfers

2 data between the virtual device driver and the shared network I/O adapter without the data

3 passing through the I/O adapter device driver.

1 9. The apparatus of claim 6 wherein the communication mechanism comprises a
2 partition manager that communicates between the first and second logical partitions.

1 10. The apparatus of claim 9 wherein the communication mechanism further
2 comprises a hosting interface in the first logical partition that communicates between the
3 I/O adapter device driver and the partition manager, wherein the partition manager
4 communicates between the hosting interface in the first logical partition and the virtual
5 device driver in the second logical partition.

1 11. An apparatus comprising:
2 at least one processor;
3 a memory coupled to the at least one processor;
4 first and second logical partitions defined on the apparatus, the first logical
5 partition controlling a shared network I/O adapter and the second logical partition using
6 the shared network I/O adapter controlled by the first logical partition;
7 an I/O adapter device driver in the first logical partition, the I/O adapter device
8 driver including a hardware interface to the shared network I/O adapter;
9 a virtual device driver in the second logical partition, the virtual device driver
10 providing a set of functions at least partially determined from functions available in the
11 I/O adapter device driver in the first logical partition; and
12 a communication mechanism that communicates between the virtual device driver
13 in the second logical partition and the I/O adapter device driver in the first logical
14 partition.

1 12. The apparatus of claim 11 wherein the set of functions for the virtual device driver
2 is at least partially determined by querying the I/O adapter device driver for its available
3 functions.

1 13. The apparatus of claim 11 further comprising a transfer mechanism that transfers
2 data between the virtual device driver and the shared network I/O adapter without the data
3 passing through the I/O adapter device driver.

1 14. The apparatus of claim 11 wherein the communication mechanism comprises a
2 partition manager that communicates between the first and second logical partitions.

1 15. The apparatus of claim 14 wherein the communication mechanism further
2 comprises a hosting interface in the first logical partition that communicates between the
3 I/O adapter device driver and the partition manager, wherein the partition manager
4 communicates between the hosting interface in the first logical partition and the virtual
5 device driver in the second logical partition.

1 16. An apparatus comprising:
2 at least one processor;
3 a memory coupled to the at least one processor;
4 first and second logical partitions defined on the apparatus, the first logical
5 partition controlling a shared network I/O adapter and the second logical partition using
6 the shared network I/O adapter controlled by the first logical partition; and
7 a partition manager residing in the memory and executed by the at least one
8 processor, the partition manager performing the steps of:
9 (1) receiving at least one transmit message from a virtual device driver in
10 the second logical partition;
11 (2) sending at least one transmit message to an I/O adapter device driver in
12 the first logical partition that includes a hardware interface to the shared network
13 I/O adapter; and
14 (3) transferring data from the virtual device driver in the second logical
15 partition to the shared network I/O adapter without the data passing through the
16 I/O adapter device driver in the first logical partition.

1 17. The apparatus of claim 16 wherein the virtual device driver provides a set of
2 functions at least partially determined from functions available in the I/O adapter device
3 driver in the first logical partition.

1 18. The apparatus of claim 17 wherein the set of functions for the virtual device driver
2 is at least partially determined by querying the I/O adapter device driver for its available
3 functions.

1 19. A computer-implemented method for sharing a shared network I/O adapter
2 between first and second logical partitions on a computer apparatus, the method
3 comprising the steps of:

4 (A) providing an I/O adapter device driver in the first logical partition, the I/O
5 adapter device driver including a hardware interface to the shared network I/O adapter;

6 (B) determining a plurality of functions provided by the shared network I/O
7 adapter;

8 (C) providing a virtual device driver in the second logical partition, the virtual
9 device driver providing a set of functions at least partially determined by the plurality of
10 functions determined in step (B); and

11 (D) controlling exchange of information between the virtual device driver and the
12 I/O adapter device driver.

1 20. The method of claim 19 wherein step (B) is performed by querying the I/O adapter
2 device driver for its available functions.

1 21. The method of claim 19 further comprising the step of transferring data between
2 the virtual device driver and the shared network I/O adapter without the data passing
3 through the I/O adapter device driver.

1 22. The method of claim 19 wherein step (D) is performed by a partition manager that
2 communicates between the first and second logical partitions.

1 23. A computer-implemented method for sharing a shared network I/O adapter
2 between first and second logical partitions on a computer apparatus, the method
3 comprising the steps of:

4 (A) defining the first and second logical partitions, the first logical partition
5 controlling the shared network I/O adapter and the second logical partition using the
6 shared network I/O adapter controlled by the first logical partition, the first logical
7 partition comprising an I/O adapter device driver that includes a hardware interface to the
8 shared network I/O adapter, the second logical partition comprising a virtual device driver
9 that receives data to be sent to the shared network I/O adapter and data received from the
10 shared network I/O adapter;

11 (B) determining a plurality of functions provided by the shared network I/O
12 adapter;

13 (C) providing a set of functions for the virtual device driver that is at least
14 partially determined by the plurality of functions determined in step (B); and

15 (D) communicating between the virtual device driver and the I/O adapter device
16 driver.

1 24. The method of claim 23 wherein step (B) is performed by querying the I/O adapter
2 device driver for its available functions.

1 25. The method of claim 23 further comprising the step of transferring data between
2 the virtual device driver and the network I/O adapter without the data passing through the
3 I/O adapter device driver.

1 26. The method of claim 23 wherein step (D) is performed by a partition manager that
2 communicates between the first and second logical partitions.

1 27. A computer-implemented method for sharing a shared network I/O adapter
2 between first and second logical partitions on a computer apparatus, the method
3 comprising the steps of:

4 (A) defining the first and second logical partitions on the apparatus, the first
5 logical partition controlling the shared network I/O adapter and the second logical
6 partition using the shared network I/O adapter controlled by the first logical partition;

7 (B) providing an I/O adapter device driver in the first logical partition, the I/O
8 adapter device driver including a hardware interface to the shared network I/O adapter;

9 (C) providing a virtual device driver in the second logical partition, the virtual
10 device driver providing a set of functions at least partially determined from functions
11 available in the I/O adapter device driver in the first logical partition; and

12 (D) communicating between the virtual device driver in the second logical
13 partition and the I/O adapter device driver in the first logical partition.

1 28. The method of claim 27 wherein the functions available in the I/O adapter device
2 driver are determined by querying the I/O adapter device driver for its available functions.

1 29. The method of claim 27 further comprising the step of transferring data between
2 the virtual device driver and the shared network I/O adapter without the data passing
3 through the I/O adapter device driver.

1 30. The method of claim 27 wherein step (D) is performed by a partition manager that
2 communicates between the first and second logical partitions.

1 31. A computer-implemented method for sharing a shared network I/O adapter
2 between first and second logical partitions on a computer apparatus, the method
3 comprising the steps of:

4 (A) defining the first and second logical partitions on the apparatus, the first
5 logical partition controlling a shared network I/O adapter and the second logical partition
6 using the shared network I/O adapter controlled by the first logical partition;

7 (B) providing a partition manager that performs the steps of:

8 (B1) receiving at least one transmit message from a virtual device driver in
9 the second logical partition;

10 (B2) sending at least one transmit message to an I/O adapter device driver
11 in the first logical partition that includes a hardware interface to the shared
12 network I/O adapter; and

13 (B3) transferring data from the virtual device driver in the second logical
14 partition to the shared network I/O adapter without the data passing through the
15 I/O adapter device driver in the first logical partition.

1 32. The method of claim 31 further comprising the step of determining a set of
2 functions for the virtual device driver in the second logical partition from functions
3 available on the I/O adapter device driver.

1 33. The method of claim 32 wherein the functions available in the I/O adapter device
2 driver are determined by querying the I/O adapter device driver for its available functions.

1 34. A program product comprising:
2 (A) an I/O adapter sharing mechanism comprising:
3 (A1) an I/O adapter device driver for installation in a first logical partition,
4 the I/O adapter device driver including a hardware interface to a shared network
5 I/O adapter;
6 (A2) a virtual device driver for installation in a second logical partition,
7 the virtual device driver providing a set of functions at least partially determined
8 by functions available in the I/O adapter device driver; and
9 (A3) a communication mechanism that controls exchange of information
10 between the virtual device driver and the I/O adapter device driver;
11 (B) computer readable signal bearing media bearing the I/O adapter sharing
12 mechanism.

1 35. The program product of claim 34 wherein the signal bearing media comprises
2 recordable media.

1 36. The program product of claim 34 wherein the signal bearing media comprises
2 transmission media.

1 37. The program product of claim 34 wherein the set of functions for the virtual
2 device driver is at least partially determined by querying the I/O adapter device driver for
3 its available functions.

1 38. The program product of claim 34 wherein the I/O adapter sharing mechanism
2 further comprises a transfer mechanism that transfers data between the virtual device
3 driver and the shared network I/O adapter without the data passing through the I/O
4 adapter device driver.

- 1 39. The program product of claim 34 wherein the communication mechanism
- 2 comprises a partition manager that communicates between the first and second logical
- 3 partitions.

- 1 40. The program product of claim 39 wherein the communication mechanism further
- 2 comprises a hosting interface in the first logical partition that communicates between the
- 3 I/O adapter device driver and the partition manager, wherein the partition manager
- 4 communicates between the hosting interface in the first logical partition and the virtual
- 5 device driver in the second logical partition.

1 41. A program product comprising:
2 (A) a partition manager that performs the steps of:
3 (1) receiving at least one transmit message from a virtual device driver in a
4 second logical partition;
5 (2) sending at least one transmit message to an I/O adapter device driver in
6 a first logical partition that includes a hardware interface to a shared network I/O
7 adapter; and
8 (3) transferring data from the virtual device driver in the second logical
9 partition to the shared network I/O adapter without the data passing through the
10 I/O adapter device driver in the first logical partition; and
11 (B) computer readable signal bearing media bearing the partition manager.

1 42. The program product of claim 41 wherein the signal bearing media comprises
2 recordable media.

1 43. The program product of claim 41 wherein the signal bearing media comprises
2 transmission media.

1 44. The program product of claim 41 wherein the virtual device driver provides a set
2 of functions at least partially determined by functions available in the I/O adapter device
3 driver in the first logical partition.

1 45. The program product of claim 44 wherein the set of functions for the virtual
2 device driver is at least partially determined by querying the I/O adapter device driver for
3 its available functions.

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